

**RECOMMENDED
BREEDING POLICY
FOR
THE MAINE COON CAT**



LIST OF CONTENTS

Introduction and History

Genetic make-up

Breeding System

Type

Colour & Pattern

Genetic Defects

Mentoring

BAC Recommendations

Useful References

MAINE COON BREEDING POLICY

Introduction and History

This breeding policy accompanies and supplements the Maine Coon Registration Policy and should be read in conjunction with that document.

The aim of the breeding policy is to give advice and guidance to ensure breeders observe what is considered “best practice” in breeding Maine Coons. The over-riding objective is to improve the Maine Coon cat, working to meet all aspects of the Maine Coon Standard of Points, which describes the ideal for the Maine Coon cat.

The origins of the Maine Coon are shrouded in mystery and legend. The basis of the Maine Coon cats are probably New England barn cats which were taken to farm shows by their owners.

The Maine Coon is now well established in the UK, and was first registered in 1984 and gained championship status in 1994, having originally been shown on exhibition. There has now been over 25 years of breeding which has developed and fixed good phenotype in the breed along with a wide and diverse gene-pool. Original imports were from many different pedigrees and different lines. Originally, imports into this country in the early 1980's and 1990's were from the USA, but later breeders began to import from Europe too, including from newer foundation lines. This trend has continued up to today, with different lines being imported to add diversity to the gene pool in this country. The breed was accepted into GCCF initially at preliminary status, in 1988. Breeders worked hard to get more cats out onto the show bench and provisional status was achieved in 1992. Full Championship status was achieved in 1994. Currently there are three classes for Maine Coons in GCCF – Brown Tabby series (including both accepted tabby patterns in brown and it's dilute form of blue, either with or without white), Silver Tabby series (including both accepted tabby patterns in all silver tabby series cats, black silver, blue silver, red silver and cream silver as well as silver tortie tabby females, all may be with or without white). The third class is the Any Other Colour (AOC) which includes shaded, smoke and solid (non-agouti) cats, again, with or without white.

Cats brought in from foundation lines are still placed upon the reference register until there are no unknown ancestors within five generations, when subsequent litters can be registered as full Maine Coons.

Breeders are encouraged to work towards a low inbreeding co-efficient level, and to refer to the pawpeds program available on line to draw up planned matings, in order to assess such levels. (<http://pawpeds.com/userguide/>) It is not recommended that an inbreeding COI of more than 6.25% should be allowed, and ideally, should be as low as possible. This is equivalent to the breeding together of first cousins. More information is available on the link given.

In addition, the MCBAC would strongly advise that current gene tests for HCM are undertaken to identify the status of cats before breeding. This can be followed up with later scanning and work is currently underway to arrange this facility in the UK at a cost that would make it more advantageous to breeders. There are other genetic tests, for SMA (Spinal Muscular Atrophy) and for PKD (Polycystic Kidney Disease) that breeders may well consider advantageous to have done. Neither of these diseases have been much evidenced in the UK, but are known to exist in Europe, and may well be worth considering, particularly for cats imported from European lines. For further information on health issues, see the section on page 14 on Genetic defects.

Having successfully “fixed” the type and specific appearance of the Maine coon, it is important to work towards and maintain the specific appearance of the Maine Coon. It is important to improve other aspects of the breed such as colour and pattern, choosing breeding cats that exhibit good markings and colour, as well as type.

The Maine Coon is considered to be a “natural breed” and as such breeders should always aim to maintain the natural appearance of the cat, with no introduction of unusual colours or patterns allowed. It is accepted that since the allowable colours include the Inhibitor gene, allowing for silver, silver shaded and smoke colours, this must at some time in the past have been compromised. The MCBAC is keen that no other colouring or pattern is introduced in the future. There are no permitted outcrosses. (See Registration Policy).

Genetic Make-up

As stated the Maine Coon holds a wide and varied group of both dominant and recessive genes; one can not make sense of the Maine Coon breed without a basic understanding of the genetic make-up.

All domestic cats are descended from a wild ancestor (probably either *Felis silvestris* or *Felis lybica*) a mackerel tabby patterned animal, and thus all domestic cats are of an underlying genetic tabby pattern. All cats have 19 pairs of chromosomes upon which there are many thousands of genes that govern the eventual shape, size, sex, colour, pattern and hair length of the individual animal. Genes are expressed as a capital letter if they are dominant, and a lower case letter if recessive. Cats that have a mixed pair of genes, (ie for Agouti pattern or tabby - as opposed to solid the - letters are A and a. A cat with a mixed pair (Aa) will always SHOW the dominant gene, and will appear to be Agouti (tabby), but can still produce non-Agouti or solid cats, without tabby pattern, if mated to another cat that has the a or recessive, gene. Over the generations a number of mutations have occurred and selective breeding has been used to isolate these to produce the various pedigree breeds we see today. There are now some tests for Dominant and dilute (Dd) colouring, and for Agouti and non-Agouti (Aa) colouring that breeders can use to aid their breeding programs. These can be obtained by contacting Langford University http://www.langfordvets.co.uk/laboratory_owners.htm

In the case of the Maine Coon the key genes influencing the colours, coat length and patterns within the breed are:

Agouti (A) - the natural "wild" gene that is the basis of the tabby cat. The base agouti pattern is bands of black on a yellow background; in the cat this is overlaid with one of the tabby patterns. Currently only Classic or Blotched (tb) and Mackerel (T) patterns are accepted in show standard Maine Coons, with the Classic being more popular of the two. The Classic pattern is recessive to the dominant Mackerel pattern.

Non- agouti or "hypermelanistic" (a) - a recessive gene mutation that turns the original "wild" tabby cat into a self black by overlaying the agouti base colour with melanic pigment, making the whole animal appear black, although often in certain light the underlying tabby pattern may still just be discernible. Other genes work to change this black pigment to other colours (see below).

Black (B) The recessive chocolate gene (b) is not acceptable in Maine Coons.

Full Colour Gene (C). This allows for Maximum pigmentation. The recessive gene, cb, cs or ca and c are seen in Burmese, Siamese, Blue-eyed albino and Albino, and are not accepted in Maine Coons.

Dense Pigmentation (D) Dominant gene which makes the pigment granules deposit along the hair shaft in an even manner giving a darker colour i.e. black and red. The recessive gene (d) has the effect of clumping the particles of pigment in the cat's hair fibres. As a result, some parts of the hairs, individually too small to be seen with the naked eye, reflect white light, thus "diluting" the basic black to grey, usually referred to as blue. A similar effect changes red colouration to cream.

Inhibitor (I) A dominant gene that suppresses the development of pigment in the hair of the coat, typically producing hairs that are fully coloured only at the tip and have a silvery white base. It has greater effect on the lighter pigment in an agouti cat, removing the yellow colour and turning the base colour white or "silver". In the case of a non-agouti cat the inhibitor removes colour from the base of the hair-shaft to produce a silvery white hair with a coloured tip, i.e a Smoke. This allele appears to interact with other genes to produce various degrees of tipping, ranging from deeply tipped silver tabby to lightly tipped silver shaded tabby. The recessive (i) shows no such suppression of colour at the base of the hairs.

White Spotting Gene (S) This dominant gene seems to have variable expression and produces bi-colour cats with differing amounts of white markings and another colour, or colours. Homozygous cats with (S/S) generally exhibit large amounts of white colouration, (often referred to as "high white") whereas cats with (S/s) have smaller amounts, often limited to tummy, bib, and paws. However, the amount of white expressed by the S gene can vary from as little as a few small patches to large white areas, covering most of the body. Moderate white spotting usually affects mainly the underparts.

Dominant White (W) Also known as the White Masking Gene. This gene when heterozygous, (W/w) will present as a fully white cat. However, the gene masks both colour and pattern, and a white cat can produce kittens that show the underlying colour and pattern, as well as fully white kittens.

Orange (O) This is a mutation on the X chromosome and is thus sex-linked. The gene eliminates all melanin pigment (black and brown) from the hair fibres, replacing it with pheomelanin, a lighter compound appearing yellow or orange depending on the density of pigment granules. The O allele is also epistatic over the non agouti genotype; that is, the agouti to non-agouti mutation does not have a discernible effect on red or cream coloured cats, resulting in these self-coloured cats displaying tabby striping independent of their genotype at this locus. This explains why you can usually see some tabby pattern on red, cream and red and cream smoke coloured non-agouti cats, even if only on the head/face. Rufus polygenes, as yet unidentified, affect the richness of the orange gene's expression.

Tabby patterning genes (T/t) Traditionally it had been believed that the three forms of tabby pattern were inherited as an allelic series; however it now appears as if at least two, and probably three, different loci are responsible for the various tabby patterns (Lorimer, 1995). At one locus are the alleles for mackerel and blotched (classic) tabby patterns with mackerel dominant to classic; at another locus is the Abyssinian or ticked pattern, which is epistatic (masking) to both mackerel and blotched; and at the third locus there appears to be a modifying gene for either the classic or mackerel patterns resulting in the spotted tabby pattern. The patterns can be summarised as follows:

Mackerel (Mc) The basic striped tabby pattern that overlays the agouti base (ie "wild" form). This presents as a series of narrow vertical stripes down the flanks of the cat.

Ticked (T) An incompletely dominant gene which removes most of the stripe pattern leaving the ticked agouti base pattern on the body with minimal overlaying stripes on legs, chest (necklace) and face. Currently not accepted in show standard Maine Coons.

Spotted (Sp) Current thinking is that it is likely that a specific single gene causing the spotted tabby pattern, by breaking up the mackerel or classic pattern into elongated or rounder spots respectively. Currently not accepted in show standard Maine Coons.

Classic (mc) A mutation of the mackerel allele recessive to all other tabby patterns which gives a blotched pattern with the characteristic "butterfly" motif across the shoulders and "oysters" on flanks.

Wide-banding (Wb) This has been hypothesized either as a gene (Robinson) or more probably a group of genes (Joan Wasselhuber, who coined the term "wide-banding genes"). Increasing evidence for their existence has led to wide acceptance. Undercoat width genes determine the width of the undercoat whether or not the cat has a silver inhibitor gene. The term "undercoat" used here refers to part of the hair shaft closest to the body, and includes both guard hairs and the shorter hairs often referred to as "undercoat" hairs. The variability seen in the undercoat widths in cats points to the polygenetic nature of wide-banding genes. If a single gene it is likely an incompletely dominant gene mutation, the effect serving to push the darker, pattern colour in the cat up away from the hair base towards the tip, turning the normal tabby patterns into a **Shaded** or **Tipped** cat. Precisely how the agouti, inhibitor and wide-banding genes interact on a molecular level is not clear - one possibility is that the wide-banding genes influence the agouti protein production to remain high so that eumelanin pigment remains inhibited or down-regulated; another possibility is that the wide-banding gene encodes for a second inhibitory protein that also down-regulates eumelanin.

Long-hair (l) A recessive gene mutation which produces a semi-long haired cat. All maine coons are homozygous for this gene.

Polygenes – these are collections of genes which modify the effect of the main dominant and recessive genes above. A build up of polygenes creates a bigger effect, for example a collection of certain polygenes increases the length and density of the long-hair gene to create the Persian, and a build-up of polygenes serves to enhance the effect of the main colour genes, turning the effect of the orange gene from the sandy colour of the ginger domestic tom to the rich vibrant red of the Red Persian, British or Maine Coon Self (solid). It is likely that a group of polygenes is the reason for variation in the degree of tipping in the Shaded Tabbies the polygenes working to create the band-

width in interaction with the inhibitor gene (when present) resulting in the range of pattern from tipped to heavily shaded.

So, in summary, the genetics involved in the ideal tabby, shaded or smoke cat are complex. Not only are there many interacting genes, but genes sometimes do not express themselves fully, or compete with one another. For example, the melanin inhibitor sometimes does a poor job blocking pigment, resulting in an excessively grey undercoat, or in tarnishing. Likewise, poorly-expressed non-agouti or over-expression of melanin inhibitor will cause a pale, washed out black smoke. Various polygenes, epigenetic factors, or modifier genes, as yet unidentified, are believed to result in different phenotypes of colouration, some deemed more desirable than others, in the eye of the breeder.

Breeding System

Listed above are the main genes that help define the Maine Coon cat through the expression of pattern, colour and coat, but of course there are a large number of other genes that together create the distinctive physical shape and confirmation which is the essence of Maine coon breed type.

In order to ensure the maintenance of the good Maine coon breed type already achieved, while allowing scope to further improve aspects of type, coat, pattern and colour, to meet the ideal described in the Standard, breeders need to have a clear, definite and well understood **breeding system**. This means the development and management of a breeding programme in which certain cats are affirmatively selected to be bred to others, for predetermined reasons. Equally important, it also means that breeders allow no matings until they have given careful consideration to the outcome. In particular three key rules must be followed:

- **Health must be the overriding consideration in any Maine Coon breeding programme.**
- **The good and bad features of the individual cats should be assessed and weighed against each other before any mating.**
- **When planning a breeding programme, breeders must realise that doubling of the good traits in a cat also results in doubling the defects; the breeding of cats with similar faults should be avoided at all costs otherwise there is a danger of fixation.**

The prime motive is to perpetuate the Maine Coon as a recognisable breed; to improve the quality of the breed as measured against the Standard; and also to gain success on the show bench.

The skill in breeding lies in the choice of the individual cats and how these cats may be mated with each other – these two acts should be regarded as completely separate, although interconnected.

Selection

The phenotype of the individual cat is made up of a large number of genetic characteristics of varying expression. The ideal Maine Coon cat is one in which the expression of each of these characteristics is just right in the eyes of the breeder – this means that an intermediate expression will be required for some characteristics, but a more extreme expression required for others. This expression is controlled by selective breeding. However, selection by itself is not very efficient in eliminating heterozygous genotypes (the producers of variation and diversity) – it is one of the tools available, but has its limitations.

Inbreeding

Inbreeding is an inclusive term covering many different breeding combinations and degrees of relationship – including the more distant, less intense. It is consistently more efficient in eliminating heterozygous (varying and diverse) genotypes and increasing homozygous (same) genotype, thereby ensuring a greater likelihood that kittens will closely resemble their parents. Used here, the term does not mean close, purposeful, inbreeding of closely related cats (brother/sister, father daughter), but rather the moderate form that results from the mating of not too distantly related (but not directly related) cats (first cousins, half brother/half sister, second cousins, etc). Some in-breeding

is essential to stabilise conformation around a definite type. In-breeding is the act of mating individuals of various degrees of kinship, and if continued it produces ever increasing homogeneity in the offspring.

It is important to monitor the percentage intensity of inbreeding for any mating – use this consideration as a key part of the decision making process when considering any mating, and remember: **“The more intense the in-breeding, the more careful must be the selection”**. **“Loss of innate genetic variability must not be too great”**.

As mentioned on earlier, help and guidance in planning matings, to avoid too high an inbreeding coefficient is found on the pawpeds website. <http://pawpeds.com/userguide/>

The overall approach should be one of balance and moderation in the degree of inbreeding coupled with consistent selective breeding with a clear objective in mind – i.e improvement of key aspect and/or the elimination of weak traits or defective genes.

Breeding systems and practices need to operate so as to ensure the Maine Coon gene pool contains enough variation to give scope to continue improving the breed and avoid the danger of either fixing type too quickly (before the ideal of the standard is reached) or deleterious genes being expressed and fixed in the breed. Breeders need to use inbreeding to gain sufficient homogeneity to fix recognisable Maine Coon type but with sufficient variation to both enable improvement, and maintain health and vigour, avoiding fixation of defective genes or unwanted traits (and to ensure the elimination of anomalies).

Anomalies – the problem of the genetic anomaly is something of which all breeders should be aware – this is not to suggest that such anomalies are common but the cat must be expected to have its quota of defects just as are found in other animals. (See section on - Genetic Defects).

The golden rule is that health is paramount and must be constantly and consistently monitored; any evidence of weakness or the emergence of lack of vigour must be dealt with immediately through modification of the breeding system. No cat with any evidence of health problems or lack of vigour should be used for breeding.

For further reading on cat genetics and breeding practices refer to: “Robinson’s Genetics for Cat Breeders & Veterinarians” by Vella, Shelton, McGonagle and Stanglein, published by Butterworth & Heinemann.

Type

The Maine Coon is a semi-longhaired cat of medium Foreign type and is distinguished by its large size, bone structure, rectangular appearance and flowing coat.

The Maine Coon evolved as a working domesticated cat in a rural environment; this role is reflected in a muscular cat of rugged outdoor appearance with a characteristic weatherproof coat and the demeanour of an alert capable hunter. Breeders should seek to maintain this natural appearance.

Head - Medium in length, the nasal bridge being equidistant from the ear line and the tip of the nose, with the width being slightly less than the length of the head. Allowance should be made for additional breadth or jowls in mature males.

The muzzle should be square with firm chin: chin, upper lip and nose leather should fall in a perpendicular line. Cheeks should be fairly full, with high cheekbones. The bite should be level. Nose is of uniform width with shallow concave curve at the nasal bridge when viewed in profile, and without a sharp break or stop.

Ears - Large, tall ears, wide at base and tapering to appear pointed at the tip; set high but well apart.

Eyes - Full and round, spaced wide apart with a slightly oblique aperture and set. Shades of green, gold or copper; coat and eye colour may be unrelated. Odd or blue eyes are permissible in white cats.

Body and Neck - Body large to medium size, solid and muscular with breadth of chest. Long body with proportionate limbs to create the characteristic rectangular appearance; square rump. Neck moderately long; particularly thick and muscular in mature males. Legs and Paws - Substantial legs with large round paws; toes carried close, five in front, four behind.

Tail - Long, at least the length of the back, wide at the base and tapering towards the tip.

Coat: Waterproof and virtually self-maintaining, consisting of an undercoat covered by a more substantial glossy topcoat. Fur shorter on the head, neck and shoulders increasing in length down the back, flanks and tail. A fluffy appearance is undesirable.

Breeches and belly fur are full and shaggy. Frontal ruff beginning at the base of the ears; heavier in males than females. Tail fur long, profuse and flowing; not bushy. Ears feathered and preferably tufted at the tips; the ear feathering should extend beyond the outer edges of the ear. Paws tufted, with long tufts emanating from under the paws, extending backwards to create a snowshoe effect.

Coat Colour and Pattern - The Maine Coon is recognised in a variety of solid colours (including white in all eye colours); tortoiseshell; tabby colours (classic and mackerel patterns) with or without silver; shaded and smoke colours; bi-colour and parti-colour (e.g. solid/tabby/tortoiseshell/shaded/smoke colour and white).

Colour & Pattern

More work is necessary to improve some aspects of colour and pattern in the Maine Coon breed. It is recommended that breeders should have a clear aim in mind and pursue one objective at a time, while looking to avoid losing what has already been achieved.

There are a number of books on genetics that can be recommended to breeders

Robinsons Genetics for cat breeders
The Legacy of the Cat
The Book of the Cat

Self or Solid

Breeders should aspire to produce a solid Maine Coon with a solid even coat colour (Black, blue, red, cream) free from any evidence of ghost tabby markings and with colour which ideally would be sound in colour to the roots of the hairs, so that the shade and tone of the colour at the roots should be only a little lighter than that at the tip of the hair. Ideally solid to solid matings should be undertaken, to avoid ghost barring. It needs to be remembered that the orange gene (O) in red cats works in a different way, and is affected by being epistatic over the non agouti genotype, and may well display tabby barring independent of their genotype. If working with this colour, breeders are recommended to choose cats with as little evidence of tabby markings as possible.

Smoke

The Smoke Maine Coon has the appearance of being a self or solid coloured cat, but with a silver base to the hairs that give the smoke effect when the cat moves. This silver base is due to the action of the Inhibitor gene (I) working in conjunction with the non-agouti gene (a). The ideal smoke has silver extending one third of the hair length, and ideally, no more than half, and the adult should be clear of any ghost tabby markings.

The Inhibitor gene can be quite volatile in its expression and breeders should select for the correct amount of silver when mating two cats to ensure the desired "smoke" effect in the offspring. Ideally, mating smoke to smoke should select for the correct amount of silver. A clear top colour is highly

desirable and is more likely when mating smoke to smoke as matings to tabby cats will increase the likelihood of ghost tabby markings persisting into adulthood.

Shaded

The Shaded Maine Coon is technically a silver tabby cat, (Agouti, plus Inhibitor gene) with most likely, the wide banding gene also present. It is the action of the inhibitor gene and wide-banding gene(s), coupled with a range of other polygenes which most likely push the pattern colour up the hair-shaft towards the tip, thus creating the shaded effect. The best definition of a shaded pattern is one in which the hairs are tipped with colour and the overall appearance is of a cat without striping, slightly darker along the top midline and shading to untipped on the underparts. It is important to understand that the silver gene does not always need to be present for a shaded cat to occur. The effect of the wide banding gene on a brown tabby would, in theory, cause a more yellowy shaded effect (golden?) and breeders should be aware that this colour can occur.

The ideal to aim for in a shaded Maine Coon is a cat that has colour tipped hairs with the base colour extending at least half the way to the tip, with minimal or no barring on the legs and tail, with non-tipped hairs on the underbelly and inside of the legs. The Shaded pattern is defined by the overall appearance of the cat, which should have minimal tabby markings. The genetics of the Shaded cat are considerably more complicated than that of most tabby cats, it is more than a homozygous unpatterned cat, which would be solid, it must have a wide undercoat width and proper banding of the hair so that it appears tipped with colour.

Breeders should aim to produce cats with medium to light shading, rather than heavy shading, as the visibility of ticked hairs creating patterning is greater when shading is heavy. They should choose cats for breeding that appear (ie are phenotypically or visually) shaded, and aim to mate shaded to shaded, using cats with as little visible pattern as possible. Alternatively, mating to a smoke, particularly one that exhibits a lot of silver, would be a good alternative.

Classic and Mackerel Tabby Patterning

Breeders should where possible choose cats with good markings to breed from. The aim must be to create a clearly defined pattern with good contrast to a warm rich agouti base, or clear silver base in the case of silver tabbies, with no tarnishing. The recommended ideal is to mate like to like, ie. Classic to classic, or mackerel to mackerel. Breeders should look to the long term objective in their breeding programme and seek to balance improving pattern and enhancing and maintaining good type. Since the introduction of the breed into the UK, breeders have worked to improve the classic pattern and this is now generally very clear and well marked. Work yet needs to be done on the Mackerel pattern, which is generally more affected by the long hair genes in the Maine Coon, which serves to more easily break up the visual effect of the stripes.

Genetic Defects

It is worth commenting here on a limited number of serious genetic defects which have manifested in the Maine Coon, however it is important to stress that to date there is little or no evidence of confirmed incidents of most these genetic disorders in the Maine Coon.

Polycystic Kidney Disease Persian breeds have suffered from PKD, a deleterious gene mutation which causes enlarged kidneys composed of dilated cystic channels, resulting in early kidney failure and death. A test is available. Because of the lack of history to foundation cats, it may, in the future, be found necessary to test more cats. Breeders should be aware that this condition could be in existence in the breed.

http://www.langfordvets.co.uk/laboratory_owners.htm

Flat-chest syndrome There is good evidence that this is caused by a simple recessive gene, but it may also have a more complex genetic cause; the disorder results in a kitten with a compressed flattened rib-cage that has difficulty in breathing, etc. It can be fatal in a number of cases, depending on degree of severity. No test is yet available. This condition, where kittens develop a flattening of the chest wall structure either from birth, or shortly after, is a little-understood condition, that can occur in all breeds. Langford University are currently undertaking a joint research study into this condition, with UC Davis and would welcome genetic samples from affected cats and kittens. Samples from

those which have recovered completely and no longer show outward signs of the condition are also needed. Samples are taken by simple mouth swab and should be clearly marked as swabs for research into FCK. The MCBAC would encourage all Maine Coon breeders to contact them, and offer samples if they experience this syndrome in their own breeding. Guidance upon how to take the samples, and the condition itself are available from Langford, as are swabs. Swabs should be sent to Langford Veterinary Services, Diagnostic Labs (FAO: Victoria Rossley – FCK Study), Churchill Building, Langford House, Langford, Bristol, BS40 5DU.

Bites Incorrect bites can be an issue in the Maine coon; although not a serious fault in the breed, there are enough incidents to necessitate breeders monitoring their cats and kittens regularly and carefully to ensure this anomaly does not become endemic. Generally bites that are misaligned tend to be undershot, but occasionally overshot bites are seen (Figs 16 & 17)

Fig 16

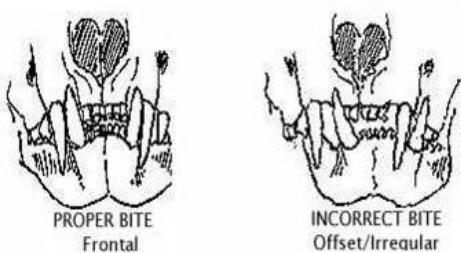
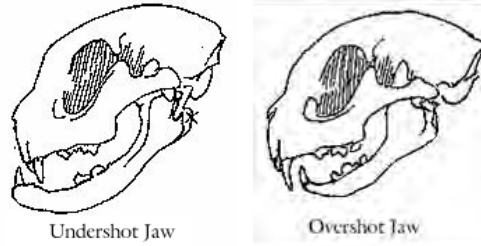


Fig 17



HCM Hypertrophic cardiomyopathy (HCM) is a condition characterised by the inward thickening of the heart muscle, resulting in a reduction of chamber volume, thereby reducing the volume of blood that the heart can pump with each contraction.

It is a condition found in all mammals, including man. Genetic testing of affected cats can be useful in identifying which cats carry the mutation. Whilst a positive test result means that the cat is genetically predisposed to HCM, unfortunately a negative test only means that the cat does not have that one particular mutation. It does not mean that the cat being tested doesn't have HCM, but is a start towards identifying cats that do carry the gene so that in time, they can be eliminated from the breeding program.

Further information on this condition can be found on the FAB site: <http://www.fabcats.org/owners/heart/cardiomyopathy.html>

And on International Cat Care:

<http://www.icatcare.org/advice/cat-health/hypertrophic-cardiomyopathy-hcm-and-testing>

There is a non invasive gene test available in Maine Coons, at Langford, and both GCCF affiliated Maine Coon Clubs offer a discount for members in the costs of this test.

http://www.langfordvets.co.uk/laboratory_owners.htm

Scanning - This is recommended when your vet discovers irregular heart sounds. There are many conditions that can cause this, and scanning can help to identify the cause, as well as giving an indication if HCM is present. Langford now offer scanning at a reasonable cost, with discounts for breeders, and for those booking more than four cats into one session. Further information can be found here:

<http://www.langfordvets.co.uk/small-animal-hospital/services/screening-unit>

- It is recommended by the Maine Coon BAC that all breeders should at least know the status of their breeding cats.
- The MCBAC considers that it is no longer desirable to be breeding from homozygous cats and that any breeding from heterozygous cats should be done only with the intention of clearing lines.
- It is recommended by the MCBAC that any cat offered for outside stud service should provide the owner of the queen with a copy of the stud's status.

Patella luxation Luxating Patella (or trick Knee, subluxation of patella, or floating patella) is a condition in which the patella, or kneecap, dislocates or moves out of its normal location. Bilateral involvement is most common, but unilateral is not uncommon. Animals can be affected by the time they are 8 weeks of age. The most notable finding is a knock-knee (genu valgum) stance. The patella is usually reducible, and laxity of the medial collateral ligament may be evident. The medial retinacular tissues of the stifle joint are often thickened, and the foot can be seen to twist laterally as weight is placed on the limb. It is not a common condition but occurs occasionally, and breeders should be aware of it, and not breed from affected cats.

Cow hocking This is described as where the back leg joints are set incorrectly. It can result in uneven weight bearing and possible weak thrust from these legs. Good conformation is important and cats for breeding should be selected with care.

White cats and deafness Research has shown that all white cats, of whatever colour eyes, are at risk of deafness, either unilaterally or bilaterally. Further information can be found here:

<http://www.icatcare.org/advice/cat-health/inherited-deafness-white-cats>

The MCBAC recommends that all white cats should be BAER or OAE tested before breeding. As deaf cats would be at a disadvantage in the show hall, and easily startled, it is recommended that white show cats, as well as cats intended for breeding, should be tested.

The Brainstem Auditory Evoked Response (BAER) test is based on the electrical response of the brain to auditory stimuli. When a sound enters the ear, tiny electrical impulses are generated by components of the auditory pathway. The signals can be picked up by recording electrodes positioned on the head and are, in turn, passed into a computer. A series of clicks are passed into the ear through a headphone, producing a repeatable sequence of peaks and troughs which is displayed on a small TV screen. The test offers quick, non-invasive and accurate assessment of an individual's hearing status. (Info from the Animal Health Trust).

BAER testing is now available at Langford. Further information and costs is here:

<http://www.langfordvets.co.uk/small-animal-hospital/services/screening-unit#tab-2>

In addition, the following centres offer BAER testing nationally:

Cheshire – Cranmore Veterinary Centre Tel: 0151 339 9141

Derby – www.scarsdalevets.com Tel: 01332 245 191

Dorset/Hampshire – www.scvetspecialists.co.uk Tel: 01425 485615

Kent – Church Farm clinic Tel: 0151 327 1885

Glasgow – www.gla.ac.uk/faculties/vet/smallanimalhospital Tel: 0141 330 5848

Hampshire – www.seadownvets.co.uk Tel: 02380 842237

Manchester – www.amcreferrals.com/2-5-electrophysiol.html Tel: 161 881 3329

Suffolk – www.aht.org.uk/ahtequine.thml Tel: 01638 751000

Hip Dysplasia It was initially believed that because the Maine Coon is a large cat, it would, like large dogs, pose a risk of this condition. However, the reported incidence of this in this country would appear to be very low. The MCBAC would recommend that breeders with concerns over the gait of cats they believe to be affected should seek to send X-rays to OFA (The Orthopaedic Foundation for Animals (<http://www.offa.org/>) or Penn Hip (University of Pennsylvania) (<http://research.vet.upenn.edu/Default.aspx?alias=research.vet.upenn.edu/pennhip>) for scoring. It is understood that cats naturally have a more shallow acetabulum than dogs, and a specialist review of the X-rays is needed, in order to determine the presence of the condition.

Spinal Muscular Atrophy (SMA) SMA is an inherited disorder affecting the skeletal muscles of the trunk and limbs. Loss of neurons in the first few months of life leads to muscle weakness and atrophy that first becomes apparent at 3-4 months of age. Affected kittens develop an odd gait with a sway of the hindquarters and stand with the hocks nearly touching. They may also stand with toes out in the front. By 5-6 months of age they are too weak in the hindquarters to readily jump up on furniture and often have a clumsy landing when jumping down. The long haired Maine Coon may hide it, but careful feeling of the limbs will reveal reduced muscle mass. Affected kittens are not in pain, they eat and play avidly, they are not incontinent, and most live very comfortably as indoor cats for many years.

Known affected kittens have occurred in breeding programs across the United States, and, in retrospect, likely carriers have been exported widely. There is a test available for this from Langford University. http://www.langfordvets.co.uk/laboratory_owners.htm

Whilst it is not known to be a problem in the UK, the MCBAC would advise breeders to consider testing for this gene in imported cats in order to avoid it being inadvertently passed on to become a problem for the breed at a later date.

Polydactyly This is a condition where the presence of an autosomal dominant gene causes the formation of extra toes on one or more feet. Although most cats with this gene will exhibit obvious extra toes, in some cases, the extra bones and joints may only be visible under an x-ray of the skeletal structure. The MCBAC do not accept the use of polydactyl cats in breeding programs in the UK at all. Breeders are asked to consider carefully when importing breeding cats whether or not any polydactyl cats feature in the lineage of their cat, and if so, to consider having an X-ray done to detect the presence of such skeletal deformities having passed unnoticed.

A full list of genetic anomalies is given in the GCCF Standard List of Withholding Faults for all Breeds. Breeders and exhibitors should familiarise themselves with these and be aware of the implications of breeding with or showing any cats with any of these defects.

Other physical defects, behavioural problems and health problems may have a genetic component and should not knowingly be perpetuated in the breed. Within the Maine Coon breed, no such defects are especially common, but breeders can find a comprehensive list of anomalies known in various breeds in the GCCF Breeding Policy which may be purchased from the GCCF.

The golden rule for all Maine Coon breeders is that health is paramount and must be consistently and constantly monitored.

Maine Coons used in breeding programmes should be of show quality, demonstrating pleasing type, sound conformation, correct colour and patterning. They should be of good temperament and respond to their owners with affection. A happy, healthy Maine Coon is a joy to own.

Breeders should register all of their kittens to ensure those not suitable for breeding are placed on the non-active register and cannot be bred from by the new owner. Novice owners of breeding females will find the Maine Coon Breed Advisory Committee, and its two constituent clubs, the Maine Coon Cat Club and the Maine Coon Breed Society, all have committee members only too willing to support and advise regarding Maine Coon studs that will be a suitable choice for their female with regard to health, type, colour and quality.

Mentoring

All new Maine Coon breeders should start under the guidance of a mentor, an experienced breeder who has already bred a number of Maine Coon litters. This is especially important for novice breeders with little or no prior experience of cat breeding, but support is, of course, also available to breeders who may have experience of other breeds but are new to the Maine Coon breed. If a new breeder does not have a mentoring relationship with the breeder of their cat, a mentor can be identified by contacting the Secretary of either the Maine Coon Cat Club <http://www.maine-coon-cat-club.com/> or the Maine Coon Breed Society <http://www.mainecoonbreedsociety.com/>

All breeders are strongly recommended to become a member of one of the affiliated breed clubs and to participate in ongoing education and development about cat breeding through participation in appropriate discussion forums, seminars and cat club meetings.

BAC recommendation

Maine Coon breeders with a particular interest in a specific Maine Coon colour or pattern are encouraged to work closely with other like-minded breeders to devise and implement a planned breeding programme aimed at improving the colour or pattern in question. The Maine Coon BAC and the GCCF Genetics Committee are keen to offer advice and guidance to promote and support such breeding programmes. The MCBAC recommends that breeders re-read this Breeding Policy, as well as the general GCCF Breeding Policy, the Maine Coon Registration Policy, and the Maine Coon Standard of Points, regularly.

Copies of these policies should be given to all prospective owners of Maine Coons to be used for breeding on the Active Register.

All Maine Coon breeders are encouraged to take advantage of any relevant official scheme, which may be devised by the BAC to test the soundness of the Maine Coon Breed.

Breeders should have all breeding cats tested for their HCM status. Cats homozygous for this gene should not be used for breeding, and cats heterozygous for this gene should only be used for breeding with an aim to clear lines. Owners of male cats used for stud should give owners of visiting Queens a copy of the stud's HCM status.

Maine Coon breeders are encouraged to work with other like-minded breeders to improve the breed and realise shared objectives whilst maintaining a diverse gene pool.

Breeders are urged to observe the GCCF Code of Ethics, the recommendations of the GCCF, the advice of their mentor and their own veterinary surgeons regarding cat welfare, the importance of neutering, health inoculations, etc.

The BAC recommends that breeders should think carefully before selling any Maine Coon cats on the Active Register, taking into consideration the purchaser's experience and that no kitten should be sold onto the Active Register to a breeder new to the breed without ensuring that a mentoring relationship is in place, either with the breeder of the kitten or another suitably experienced breeder.

Maine Coon breeders should take note of the Maine Coon Registration Policy as it is applied by the GCCF before purchasing and importing a cat from another registration body. The GCCF Maine Coon Policy requires FIVE generations of Maine Coons in recognised colours to be present on the pedigree.

To ensure the integrity of the fifth generation, the GCCF Registrar will also need to investigate the sixth or further generations.

The Maine Coon Breed Advisory Committee is always there to provide advice to all Maine Coon owners and breeders and will do everything it can to promote our breed.

Useful References:

"Robinson's Genetics for Cat Breeders & Veterinarians" by Vella, Shelton, McGonagle and Stanglein, published by Butterworth and Heinemann.

"That Yankee Cat" by Marylis Hornidge

"The Maine Coon Cat" by Carol Daly

(both available on Amazon)

Maine Coon Cat Club Website - <http://www.maine-coon-cat-club.com/>

Maine Coon Breed Society Website - <http://www.mainecoonbreedsociety.com/>

GCCF Website – <http://www.gccfcats.org/>

Feline Advisory Bureau – www.fabcats.org

Langford University Bristol –

http://www.langfordvets.co.uk/laboratory_owners.htm